UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/804,248	03/13/2001	Ashfaq Hossain	Hossain 2	7720

47396	7590	07/19/2005

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EXAMINER
ALI, SYED J

ART UNIT	PAPER NUMBER
2195	

DATE MAILED: 07/19/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

	Application No.	Applicant(s)
	09/804,248	HOSSAIN, ASHFAQ
Office Action Summary	Examiner	Art Unit
	Syed J. Ali	2195

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _3_ MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed
  after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any
  earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on _09 May 2005_.

2a)☒ This action is **FINAL**.   2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is
    closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) _1-25_ is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) _1-25_ is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All   b)☐ Some * c)☐ None of:

    1.☐ Certified copies of the priority documents have been received.

    2.☐ Certified copies of the priority documents have been received in Application No. _____.

    3.☐ Copies of the certified copies of the priority documents have been received in this National Stage
        application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
   Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413)
   Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1.   This office action is in response to the amendment filed May 9, 2005. Claims 1-25 are

presented for examination.

2.   The text of those sections of Title 35, U.S. code not included in this office action can be

found in a prior office action.

Claim Rejections - 35 USC § 102

3.   **Claims 1-7, 10, 15-18, and 21 are rejected under 35 U.S.C. 102(b) as being**

anticipated by Sodan et al. ("Hierarchical Fuzzy Configuration of Implementation

Strategies") (hereinafter Sodan).

4.   As per claims 1-4, Sodan teaches the invention as claimed, including a load-balancing

unit adapted to apply fuzzy logic rules to sets of fuzzified, dynamic network-related indicator

values and to generate a selection index associated with each set of indicator values (Abstract;

p.257; Fig. 7), wherein the unit comprises a load balancing switch, router, or programmed

medium (p. 257).

5.   As per claims 5-6, Sodan teaches the invention as claimed, including the unit as in claim

1 further adapted to direct a request to a server associated with one of the generated selection

indices (p. 250), the server being associated with a highest selection index (p. 254; Fig. 7).

6.   As per claim 7, Sodan teaches the invention as claimed, including the unit as in claim 1

wherein each set of network-related indicator values is associated with a server (p. 255, 257).

7.   As per claim 10, Sodan teaches the invention as claimed, including the unit as in claim 8

wherein the indicator values comprise values associated with a response time, a number of active

connections and a delivered throughput (Fig. 7).

8.   As per claims 15, 16-18, and 21, Sodan teaches the invention as claimed, including a

method for selecting Internet servers able to be implemented on the load-balancing unit of claims

1, 5-7, and 9-10, respectively (p. 250).

Claim Rejections - 35 USC § 103

9.   **Claims 8-9 and 19-20 are rejected under 35 U.S.C. 103(a) as being unpatentable**

over Sodan.

10.   As per claims 8-9, Sodan does not specifically teach the invention as claimed, including

the unit as in claim 7 wherein the server is one of multiple servers grouped together to form a

server farm for providing service for incoming requests of an Internet Service Provider and one

of each set of network-related indicator values is uniquely associated with one of the multiple

servers, and wherein one of the multiple servers is selected to provide service for one of the

incoming requests based on the selection index associated therewith.

11.   However, as Sodan is related to dynamic load balancing in a network environment, it would have been an obvious conclusion that the dynamic load balancing is performed in such a way as to choose a least loaded server among a plurality of servers. Central to Sodan is the manner in which fuzzy logic is applied and how decisions are to be made. Many applications are supported, including but not limited to, communication, message passing, memory management, scheduling, and load balancing. It is well known that there are various ways that load balancing is performed, depending on the specific needs of the computing system or application. For example, load balancing can be performed on a software level, where a plurality of worker threads exist and tasks are distributed among worker threads to maintain an even load. Alternatively, load balancing may be performed on a hardware level, where a plurality of worker threads exist and the threads are submitted for execution on different parallel processors, such that a high level of parallelism is achieved. Choosing a least loaded server is also a well-known load balancing strategy, particularly in Internet applications where many servers exist to perform the same general tasks. That Sodan does not explicitly mention choosing one server among a server farm does not indicate that such was not contemplated. Rather, the details of how load balancing is applied to networks is knowledge that one of ordinary skill in the art would clearly have, so Sodan focuses the discussion on how the inference system goes about making decisions based on fuzzy logic rules.

12.   As per claims 19-20, Sodan teaches the invention as claimed, including a method for selecting Internet servers able to be implemented on the load-balancing unit of claims 8-9, respectively (p. 250).

13.   **Claims 11-14 and 22-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sodan in view of Shibata et al. (USPN 5,939,925) (hereinafter Shibata).**

14.   As per claims 11-14, Shibata teaches the invention as claimed, including the unit as in claim 1 further adapted to generate an area associated with each fuzzy logic rule and an aggregate area from a combination of areas associated with the fuzzy logic rules (Abstract, col. 11 lines 35-45) and generate the selection index from a center of gravity of the aggregate area (Abstract, col. 11 lines 35-45)

15.   It would have been obvious to one of ordinary skill in the art to combine Sodan and Shibata since Sodan fails to explicitly detail how the selection index is arrived at. Rather, the load balancing mechanism simply distributes the request to the server that is "best" suited to service that request based on the processing load at the moment. The "centroid" or "center of gravity" method is well established within the realm of fuzzy logic. Shibata provides a way of generating control variables, such as the claimed selection index, based on center of gravity calculations generated from fuzzy logic calculations. The "center of gravity" method would be beneficial in combination with Sodan especially since in the case where multiple servers may be suitable to service a request, the best server can be found based on an aggregate of parameters.

16.   As per claims 22-25, Sodan teaches the invention as claimed, including a method for selecting Internet servers able to be implemented on the load-balancing unit of claims 11-14, respectively (p. 250).

Response to Arguments

17.   **Applicant's arguments filed May 9, 2005 have been fully considered but they are not**

persuasive.

18.   Applicant argues that *"Sodan does not...teach applying fuzzy logic rules to sets of*

fuzzified, dynamic network-related indicator values as recited in independent claims 1 and 15.

Instead...Sodan uses fuzzy classifications for application and system characteristics."

19.   The claim language pertaining to the application of fuzzy logic rules to "network-related

indicator values" is very broad. For a value to be "network-related", it merely has to be relevant

to a network application. By this measure, Sodan meets the claim limitations. Sodan discusses

at length the applications of fuzzy logic inference rules to meet dynamic load balancing

requirements, particularly in relation to distributed computing on the Internet (Introduction).

Load balancing can be implemented in a variety of ways, e.g. by evenly distributing processing

among processors, threads, or distinct computers at run-time. Alternatively, if a system becomes

unbalanced, the "dynamic" load balancing comes into play, as the various loads can be adjusted

so that processing is made more efficient. While it is not requisite for load balancing to be

related to choosing a server among a plurality of servers in a server farm, such an

implementation is clearly one of the intended uses of Sodan, particularly in Internet applications

where a "least loaded" server is desirable. Furthermore, the independent claims do not require

that the fuzzy logic rules be used to choose a least loaded server or adjust the load among

unbalanced servers. Rather, they merely require that the indicator values be "network-related",

which Sodan mentions as a possible implementation strategy.

Conclusion

20.   **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time

policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE

MONTHS from the mailing date of this action. In the event a first reply is filed within TWO

MONTHS of the mailing date of this final action and the advisory action is not mailed until after

the end of the THREE-MONTH shortened statutory period, then the shortened statutory period

will expire on the date the advisory action is mailed, and any extension fee pursuant to 37

CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

however, will the statutory period for reply expire later than SIX MONTHS from the mailing

date of this final action.

Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Syed J Ali whose telephone number is (703) 305-8106. The

examiner can normally be reached on Mon-Fri 8-5:30, 2nd Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Meng-Ai T An can be reached on (703) 305-9678. The fax phone number for the

organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent

Application Information Retrieval (PAIR) system. Status information for published applications

may be obtained from either Private PAIR or Public PAIR. Status information for unpublished

applications is available through Private PAIR only. For more information about the PAIR

system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR

system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Syed Ali
July 13, 2005

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